UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/706,889	11/13/2003	Johannes Kanters	10191/3479	7764

26646 7590 08/21/2007

KENYON & KENYON LLP
ONE BROADWAY
NEW YORK, NY 10004

EXAMINER	
OLSEN, KAJ K	

ART UNIT	PAPER NUMBER
1753	

MAIL DATE	DELIVERY MODE
08/21/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/706,889	KANTERS ET AL.	
	Examiner	Art Unit	
	Kaj K. Olsen	1753	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *04 June 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-23* is/are pending in the application.

4a) Of the above claim(s) *20-23* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-19* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *11/13/03;4/20/06*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. Applicant's election without traverse of group I, claims 1-19 in the reply filed on 6-4-2007 is acknowledged. Claims 20-23 are withdrawn from further consideration as being drawn to an unelected invention.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1-3, 8-10, 13, 14, and 16-18 are rejected under 35 U.S.C. 102(b) as being anticipated by Friese et al (USP 5,314,604).

4. Friese discloses a gas sensor for detecting a concentration of a measuring gas comprising a first solid electrolyte layer 1 and a second solid electrolyte layer 2 and a diffusion barrier 12 arranged between the first and second solid electrolyte layers. See fig. 1A and 2A and col. 3, ll. 14-41. Said diffusion barrier is in the form of a ring (see fig. 1B and 2B) and the inner circumference of the ring forms a concave cross-sectional profile between the first and second solid electrolyte layers. Although this concave cross-sectional profile is not in the same plane as the cross-sectional profile of the instant invention, applicant has not defined this concave cross-sectional profile in a manner that reads free of the cross-sectional profile of Friese.

5. With respect to detecting oxygen concentration, see col. 1, ll. 23-30.

6. With respect the concave cross-sectional profile lying in a layer plane between the first and second solid electrolyte layers, a layer plane between the first and second solid electrolyte layers would contain this concave cross-sectional profile.

7. With respect to the shape of the diffusion barrier, fig. 1B and 2B show a hollow cylinder-shape. Friese also discloses a gas access opening 5 with a diameter between 0.2 and 0.4 mm. See col. 4, ll. 65-67.

8. With respect to the cylinder-shaped measuring chamber surrounding the diffusion barrier, see fig. 1B and 2B.

9. With respect to the volume of measuring chamber and the volume of the diffusion barrier, the area of the pump electrodes is 4.7 mm^2 based on the disclosed inner and outer diameters of the pump electrodes of col. 4, ll. 52-54 (i.e. $A_{electrode} = \pi(d_{outer}/2)^2 - \pi(d_{inner}/2)^2$). Because the measurement chamber is larger than the pump electrodes (see the dotted circumference line of the measurement chamber in fig. 1B and 2B, which is larger than the pump electrodes, and also note that measurement chamber also bumps out to accommodate electrode 9), this means the area of the measurement chamber is going to be greater than 4.7 mm^2. Furthermore, because the diffusion barrier is shown to extend from the inner edge of the pump electrode to the outer edge of opening 5, this means that the area of the diffusion barrier is at most 1.45 mm^2, based on the disclosed diameters of 1.4 mm and 0.25 mm for the pump electrode and opening respectively in col. 4, ll. 52-68 and utilizing the same area calculation above. Because the area of the measurement chamber is *at least* 4.7 mm^2 and the area of the diffusion barrier is *at most* 1.45 mm^2, this means the area of the measurement chamber is larger than the

area of the diffusion barrier by a factor of *at least* 3.2. Although this factor is based on area and not volume, both the measurement chamber and the diffusion barrier have the same height so the volumes would also differ by a factor of *at least* 3.2 as well.

10. Electrodes 8 and 8' of Friese reads on the defined first and second electrodes of the claims.

11. Claims 4-7 are rejected under 35 U.S.C. 102(b) as being anticipated by Nishizawa et al (USP 4,859,307).

12. Nishizawa discloses a gas sensor for detecting the concentration of a measuring gas comprising a first solid electrolyte layer 2 and a second solid electrolyte layer 4 with a diffusion barrier 8 that extends in fig. 11 to a space between the first and second solid electrolyte layers. See fig. 11; col. 6, l. 31 through col. 7, l. 4; col. 10, ll. 13-23; and col. 12, ll. 51-57. Nishizawa shows in fig. 11 that the portion of the diffusion barrier between the first and second electrolyte layers tapers down. This means that a first area lying in a first plane between the two electrolyte layers will differ from a second area lying in a second plane between the two electrolyte layers. For example, an area in a plane closer to electrolyte 4 will be smaller than an area in a plane closer to electrolyte 2.

13. With respect to detecting oxygen, see col. 1, ll. 15-40.

14. With respect to first area lying in a central region, both the first and second areas of Nishizawa would lie in a central region.

15. With respect to the smallest cross-sectional area lying in a central plane, the smallest region of Nishizawa would lie closest to electrolyte 4. This would presumably read on

applicant's "central plane" because applicant has not defined where this central plane must be located.

Claim Rejections - 35 USC § 103

16. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

17. Claims 11 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Friese in view of Jach et al (USP 6,375,816).

18. With respect to claim 11, Friese set forth the use of a opening that had a diameter of 0.25 mm, which is very close to the claimed 0.3 mm. However, Friese set forth no criticality for the use of 0.25 mm. Jach teaches that the diameter range for the gas inlet opening includes 0.3 mm. See the figure and claim 5. It would have been obvious to one of ordinary skill in the art at the time the invention was being made to utilize the diameter teaching of Jach for the sensor of Friese because the substitution of one known diameter opening for another known diameter requires only routine skill in the art.

19. With respect to claim 12, Friese does not explicitly disclose having the inside diameter of diffusion barrier be greater than the diameter of the gas opening by 0.1 mm. However, Jach teaches precisely doing this such that the diffusion barrier does not get corrupted or clogged during the drilling of the gas opening. See col. 3, ll. 14-23 and col. 3, l. 58 through col. 4, l. 7. It would have been obvious to one of ordinary skill in the art at the time the invention was being

made to utilize the teaching of Jach for the sensor of Friese so that the diffusion barrier does not get corrupted during the drilling of the gas opening.

20. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Friese with or without Jach.

21. With respect to the claim, Friese set forth all the limitations of the claim, but only disclosed that the volume of the measuring chamber would be *at least* 3.2 times greater than the volume of the diffusion barrier. Because 3.2 would be the absolute minimum factor possible, one possessing ordinary skill in the art would recognize that a factor of larger than 4 would have required only routine skill in the art in order to account for the extra volume that the measurement chamber clearly possesses. For example, if the area of the portion of the measurement chamber containing electrode 9 were a mere 1.1 mm^2 in size, then the volume of the measurement chamber would exceed the volume of the diffusion barrier by a factor of 4. In addition, if the measurement chamber had a diameter a mere 0.3 mm larger than the diameter of the pump electrodes (see fig. 1B and 2B which show the measurement being an unspecified amount larger than the electrodes), then the volume of the measurement chamber would exceed the volume of the diffusion barrier by a factor of 4 without even taking the volume of the portion of the chamber containing electrode 9 into consideration. Furthermore, Jach disclosed that the diffusion barrier should be inset from the gas opening hole (see above) and taught the use of a 0.8 mm inner diameter for the diffusion barrier. See claim 5. If the diffusion barrier area were calculated with and inner diameter 0.8 mm instead of 0.25 mm as relied on in the calculations above, the volume of the measurement chamber would exceed the volume of the diffusion barrier by a factor of 4 without even taking the volume of the portion of the chamber containing

electrode 9 or the unspecified extra diameter of the measurement chamber over the pump electrodes into consideration. Because one possessing routine skill in the art would have been motivated to provide additional measuring chamber volume to account for both the portion containing electrode 9 and to account for the fact that the measurement chamber volume is disclosed as being larger than the volume of the accounted for by the pump electrodes, and/or because Jach teaches that the diffusion barrier should be inset from gas opening (resulting in a less effective volume of diffusion barrier), one would have clearly been motivated to rely on a volume of measurement chamber that exceeded the volume of diffusion barrier by a factor of at least 4.

22. Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Friese in view of Kunimoto et al (USP 6,773,565).

23. Friese set forth all the preceding limitations to claim 19 and further specifies the presence of a heating device 13, but did not explicitly recite the presence of heater insulation insulating the heater from the surrounding electrolyte layers. Kunimoto teaches that a heater 24 should be insulated via alumina from the surrounding solid electrolyte layers so as to prevent voltage applied to the heater from leaking to the sensor cell. See fig. 1 and col. 7, ll. 20-22. It would have been obvious to one of ordinary skill in the art at the time the invention was being made to encase heater 13 of Friese in insulating layers as taught by Kunimoto so as to prevent heater voltage leakage.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kaj Olsen whose telephone number is (571) 272-1344. The examiner can normally be reached on Monday through Friday from 8:00 A.M. to 4:30 P.M..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam Nguyen, can be reached on 571-272-1342. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

AU 1753
August 16, 2007

KAJ K. OLSEN
PRIMARY EXAMINER